The Consultative Committee for Space Data Systems

Draft Recommendation for
Space Data System Standards

SPACE LINK IDENTIFIERS

DRAFT RECOMMENDED STANDARD

CCSDS 135.0-~~B~~P-2.1

~~BLUE BOOK~~PINK SHEETS
~~November 2005~~June 2006

2.3 IDENTIFIERS ASSIGNED BY CCSDS

The values of some identifiers are assigned by CCSDS upon request by Agencies. This method for managing identifiers is denoted 'Assigned by CCSDS' in this document.

The procedure for assigning values of each of the identifiers of this category is defined by a separate CCSDS Recommendation, which is referred to in the following sections of this document.

2.4 IDENTIFIERS MANAGED BY INDIVIDUAL PROJECTS

The values of some identifiers are managed independently by the projects that use the protocols. CCSDS does not specify how to manage these identifiers. This method for managing identifiers is denoted 'Managed by projects' in this document.

Some values of the identifiers in this category may be reserved by CCSDS to be used for some specific purposes across Agencies. The values of the identifiers reserved by CCSDS are listed in the following sections of this document.

2.5 SECURITY ASPECTS OF THE SPACE LINK IDENTIFIERS

2.5.1 SECURITY BACKGROUND/INTRODUCTION

The Space Link Identifiers Blue Book documents the identifiers used by the CCSDS space link protocols, CFDP, SCPS-TP and SCPS-NP, CCSDS space packet protocol, and the CCSDS encapsulation service. It documents how these identifiers are managed and provides a list of these identifiers along with their defined and/or reserved values.

2.5.2 STATEMENTS OF SECURITY CONCERNS

2.5.2.1 General

This subsection identifies Space Link Identifiers support for capabilities responding to security concerns in the areas of data privacy, data integrity, authentication, access control, availability of resources, and auditing.

2.5.2.2 Data Privacy (also known as Confidentiality)

This Space Link Identifiers specification does not define explicit data privacy requirements or capabilities to ensure data privacy. Data privacy is expected to be ensured either by encryption techniques applied at the data link layer or at a higher layer. For example, mission application processes might apply end-to-end encryption to the contents of the CCSDS space link data units carried as data by the applicable CCSDS data transfer service. Alternatively or in addition, the network connection between communicating entities might be encrypted to provide data privacy in the underlying communication network.

2.5.2.3 Data Integrity

The Space Link Identifiers specification does not define explicit data integrity requirements or capabilities to ensure data integrity. See the individual protocol specifications listed in the References subsection (1.7) for such requirements.

2.5.2.4 Authentication

The Space Link Identifiers specification does not define explicit data integrity requirements or capabilities to ensure data integrity. See the individual protocol specifications listed in the References subsection (1.7) for such requirements.

2.5.2.5 Access Control

The Space Link Identifiers specification does not define access control requirements or capabilities for access control. See the individual protocol specifications listed in the References subsection (1.7) for such requirements.

2.5.2.6 Availability of Resources

This Space Link Identifiers specification does not define explicit capabilities to prevent denial of service. See the individual protocol specifications listed in the References subsection (1.7) for such requirements.

2.5.2.7 Auditing

This Space Link Identifiers specification does not define explicit security auditing requirements or capabilities.

2.5.3 POTENTIAL THREATS AND ATTACK SCENARIOS

The Space Link Identifiers specification does not define potential threats and attack scenarios.

2.5.4 CONSEQUENCES OF NOT APPLYING SECURITY

The consequences of not applying security to the list of protocols whose identifiers are defined in the Space Link Identifiers Blue book is an issue covered by each individual protocol specification.

7 IDENTIFIERS USED BY SPACE DATA LINK PROTOCOLS

7.1 GENERAL

Table 7-1 shows the identifiers used by the Space Data Link Protocols (references [8]-[10]) and Proximity-1 Space Link Protocol (reference [11]), and how they are managed.

Table 7-1: Identifiers Used by Space Data Link Protocols

Identifier	Used by	Management Method	Note
Transfer Frame Version Number	TM [8], TC [9], AOS [10], Prox [11]	Defined by CCSDS	See 7.2 for defined values
Spacecraft Identifier (SCID)	TM [8], TC [9], AOS [10], Prox [11]	Assigned by CCSDS	See reference [12] for assignment procedure
Virtual Channel Identifier (VCID)	TM [8], TC [9], AOS [10], Prox [11]	Managed by projects	See 7.3 for reserved values
Frame Secondary Header Version Number	TM [8]	Defined by CCSDS	See 7.4 for defined values
MAP Identifier (MAP ID)	TC [9]	Managed by projects	No value is reserved
Port Identifier (Port ID)	Prox [11]	~~Managed by projects~~Defined by CCSDS	~~No value is reserved~~See tables 7-8a and 7-8b for defined values
CLCW Version Number	TC [9]	Defined by CCSDS	See 7.5 for defined values
Packet Version Number	TM [8], TC [9], AOS [10], Prox [11]	Defined by CCSDS	See 7.6 for defined values
Protocol Identifier	Encapsulation Packet [13]	Defined by CCSDS	See 7.7 for defined values

7.6 DEFINED PACKET VERSION NUMBERS

In the Packets carried by the Space Data Link Protocols, there is a field called the Packet Version Number to identify the Packets. This is a three-bit field (see NOTE 2 below) and its values are defined by CCSDS as part of the protocol specifications.

Table 7-6 lists the Packet Version Numbers currently defined by CCSDS.

Table 7-6: Defined Packet Version Numbers

Version Number	Binary Encoded Version Number	Packet	Reference
1	000	Space Packet	[6]
2	001	SCPS-NP	[7]
3	010 (See NOTE 2 below)	IP Version 4 Datagram	[17]
8	111	Encapsulation Packet	[13]

NOTES

1 In the field of Packet Version Number in the Packets, the Binary Encoded Version Number listed above must be used.

2 The version number field of the IP version 4 Packet has four bits and contains the binary values of '0100'. However, the CCSDS Space Data Link Protocols recognize only the first three bits of this field as the Packet Version Number.

7.7 ~~DEFINED~~ PROTOCOL IDENTIFIERS

The Encapsulation Packet (reference [13]) is a data structure to encapsulate data units of some protocols so that they can be carried by a CCSDS Space Data Link Protocol. In the Encapsulation Packet, there is a field called the Protocol Identifier to identify the protocol whose data units are encapsulated. This is a three-bit field and its values are defined by CCSDS as part of the specification of the Encapsulation Packet.

When all of the values of the Protocol Identifier have been assigned, CCSDS has provided a mechanism for extending the Protocol Identifier: This is done by setting the Protocol Identifier field in the Encapsulation Packet header to '110', which signals that the 4-bit Extended Protocol ID field within the Encapsulation Packet header (see table 7-7b) is used to define the protocol encapsulated by the Encapsulation Packet.

Table 7-7a lists the Protocol Identifiers currently defined by CCSDS.

Table 7-7a: Defined Protocol Identifiers

Protocol Identifier (binary)	Protocol	Reference
000	Fill (no encapsulation data)	N/A
011	CFDP	[4]
100	IP Version 6	[18]
110	Protocol Extension (signals the use of the Extended Protocol ID for Encapsulation Service	[13]
111	Arbitrary Aggregations of Octets	N/A

Table 7-7b lists the Extended Protocol Identifiers defined for the Encapsulation Service by CCSDS.

Table 7-7b: Extended Protocol Identifiers

Protocol Identifier (binary)	Protocol	Reference
0000 through 1111	Reserved by CCSDS	

7.8 RESERVED PROXIMITY-1 PORT IDENTIFIERS

The Proximity-1 Port Identifier (reference [11]) provides the means to route user data internally (at the transceiver's output interface) to specific logical ports, such as applications or transport processes, or to physical ports, such as on-board buses or physical connections (including hardware command decoders) on either the forward and/or return proximity links.

Table 7-8a: Proximity-1 Port ID Assignments for the Forward Link for Both Physical Channels

Port Identifier (binary)	Usage	Reference
000	Bitstream	N/A
001	Hardware Commands	N/A
010	~~Space~~ Packets	[6], [7], [13], [17]
011	Reserved by CCSDS	N/A
100	Reserved by CCSDS	N/A
101	Reserved by CCSDS	N/A
110	Reserved by CCSDS	N/A
111	Reserved by CCSDS	N/A

Table 7-8b: Proximity-1 Port ID Assignments for the Return Link for Both Physical Channels

Port Identifier (binary)	Usage	Reference
000	Bitstream	N/A
001	Reserved by CCSDS	N/A
010	~~Space~~ Packets	[6], [7], [13], [17]
011	Reserved by CCSDS	N/A
100	Reserved by CCSDS	N/A
101	Reserved by CCSDS	N/A
110	Reserved by CCSDS	N/A
111	Reserved by CCSDS	N/A